


## CLAIMS

I claim:

1. A blood-free plasma expander and blood substitute for use in a subject in need thereof, comprising a solution of alpha-keratose.
2. The blood free plasma expander and blood substitute according to Claim 1 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.
3. A pharmaceutical composition useful as a blood plasma expander and blood substitute comprising a therapeutically effective amount of a solution of alpha-keratose.
4. The pharmaceutical composition according to Claim 3 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.
5. A pharmaceutically acceptable carrier comprising a solution of alpha-keratose.

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6. The pharmaceutically acceptable carrier according to Claim 5 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

7. A buffer comprising a solution of alpha-keratose.

8. The buffer according to Claim 7 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

9. A method of treating a human in need of blood comprising intravenously administering to the human an effective amount of a blood substitute comprising a solution of alpha-keratose.

10. The method according to claim 9 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

11. A method for increasing the volume of the blood circulatory system wherein the method comprises transfusing into a system having a decreased volume, a quantity of a blood volume expander which consists of a

solution of alpha-keratose, and wherein the quantity is transfused in an effective amount to increase said volume.

12. The method according to claim 11 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

13. A method for the treatment of shock which comprises administering into the circulatory system of a mammal in shock, a blood plasma expander consisting of a solution of alpha-keratose and in an effective amount to alleviate said shock.

14. The method according to claim 13 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

15. A method for maintaining an isolated mammalian organ in a viable state which method comprises perfusing the organ with an effective amount of a perfusate consisting of a solution of alpha-keratose.

16. The method according to claim 15 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

17. A method for growing established mammalian cells or isolated, fused mammalian cells in fetal calf serum-free growth medium comprising culturing said established mammalian cells or said isolated, fused mammalian cells in a fetal calf serum-free growth medium containing a solution of alpha-keratose as a substitute for fetal calf serum, wherein said cultured cells do not differentiate.

18. The method according to claim 17 wherein the solvent is from the group consisting of sterile water, sterile saline, mixed salts solution, and sterile dextrose and mixtures thereof.

19. A method for removing pathogens, poisons or toxins from blood present in a patient, said method comprising:

infusing said patient with a sufficient volume of a blood substitute solution comprising at least one water soluble oncotic agent while removing an equal volume of blood from said patient to reduce the hematocrit of said patient to 10 to 15%;

separating the blood cells of said blood from said pathogens,  
toxins or poisons;  
resuspending said blood cells in a blood plasma expander  
comprising a water soluble oncotic agent to produce a blood cell comprising  
solution; and  
infusing said patient with said blood cell comprising solution;  
whereby said pathogens, toxins or poisons are removed from  
said blood of said patient.

20. The method according to claim 19, wherein said at least one  
water soluble oncotic agent is alpha-keratose.